

REMARKS

Applicants request reconsideration of the application as amended. Claims 1 to 4, 6 to 9 and 11 to 20 are pending. Claims 5 and 10 have been canceled. Claim 1 was amended to incorporate the limitations from canceled claims 5 and 10. Claim 20 is newly presented and specifies a percent total water absorption derived from the data for the Examples set forth in Table 3.

The Examiner rejected claims 1 to 19 under 35 USC 103(a) for obviousness over the purported combination of GB 858, 127 and U.S. Pat. No. 4,670,477 (Kelly). Applicants traverse the rejection as to all pending claims as amended.

GB 858,127 only generally discloses that the hydrophilicity of polyester polyurethane foams may be enhanced by exposing the foam to a hydrolyzing agent, such as water or an alkaline solution. GB 858,127 does not suggest using a combination of (1) a polyester polyol including a hydrophilic polyester polyol made from an adipic acid and a polyethylene glycol with (2) a silicone surfactant.

The present applicants have discovered that an unexpected enhancement in the hydrophilic properties of polyester polyurethane foams can be achieved with the specific combination of certain ester polyols with a silicone surfactant, followed by treatment in a caustic bath, such as a sodium hydroxide solution. Such combination achieves improved rate of water absorption and improved total water absorption over the foams disclosed in GB 858,127. Claim 1 of the present application has been amended to make clear that at least 5 parts per 100 of the polyol comprise a hydrophilic polyester polyol made from an adipic acid and a polyethylene glycol, and that the surfactant comprise a silicone stabilizing surfactant.

That GB 858,127 does not disclose the invention as claimed in claim 1 as amended is evident from a comparison of the Examples set forth in the GB patent with the Examples set forth in the pending application. GB 858,127 measures hydrophilicity using the method

described at lines 4-16 on page 8. The hydrophilicity of foams made in Examples 2, 3 and 6 is reported. The most hydrophilic foams in GB 858,127 were made in Example 2. The foams treated for 10 and 20 minutes had a maximum hydrophilicity value of 89%. Increasing the treatment time did not further increase the amount of water absorbed.

As set out in GB 858,127, a hydrophilicity value of 89% indicates that the foam absorbed 89% of a 30 ml pool of water in 5 seconds. This number can be converted into a water absorption rate of 7.0 lbs of water/ ft²/ min. The foam sponge absorbed 89% of 30 ml of water, which is 26.7 ml of water. Since the density of water is 1 gram/ml, this volume of water would weigh 26.7 grams or 0.059 pounds. The water was absorbed through the 12.5 cm x 7.5 cm face of the foam sponge. This foam sponge face had a surface area of 93.75 cm² or 0.101 ft². Therefore, the amount of water absorbed per square foot is 0.059 lbs / 0.101 ft² or 0.584 lbs/ ft² based on a 5 second contact time. Extrapolating, this means that 7.0 lbs of water would be absorbed per square foot in one minute.

In contrast, claim 1 requires that the foam have a water absorption rate of at least 20 pounds per square foot per minute, which is nearly three times the maximum rate shown in the best examples from GB 858,127. This unexpected improvement in hydrophilic property was not shown or suggested in GB 858,127.

Kelly does not fill the gaps in the disclosure of GB 858,127. GB 858,127 uses a post-processing step – a hydrolyzing solution to remove foam cell walls to produce a reticulated structure. Kelly teaches a method to make a reticulated, open cell polyurethane foam in situ – without any post-processing steps. Kelly combines ether and ester polyols and teaches that the destabilizing effect of the ether polyols on the ester formulations creates the openness. However, because the ether polyol in combination with the ester polyol formulation destabilizes the foam, and can lead to foam collapse, Kelly expressly requires a modified polyether polyol with dispersed polymers of polyurea or ethylenically unsaturated monomers. Kelly further includes a

stabilizing surfactant generally known to stabilize polyether foams, such as an organo silicon surfactant (Col. 7, lines 24-29). Kelly does not mention hydrophilicity, and is not focused on improving hydrophilicity. Kelly's foams are intended for use in air filters.

A person of skill in the art seeking to improve the hydrophilicity of a polyurethane foam created by post-processing using a caustic solution would not be disposed to consider Kelly. The Kelly patent does not mention foam hydrophilicity or water absorption, and avoids any post-processing step altogether. The Examiner's purported combination of GB 858,127 and Kelly is hindsight based, and based solely on Kelly's mention of silicone surfactants. But Kelly's specific teaching is that silicone surfactants can improve an in situ reticulation where a combination of ether and ester polyols is used. This teaching from Kelly would not lead persons of skill to modify the teachings of GB 858,127 to add a silicone surfactant where GB 858,127 does not concern mixing different species of polyether and polyester polyol.

The method of claim 1 unexpectedly produces a hydrophilic polyurethane foam with a rate of absorption about triple that of the best examples set forth in GB 858,127. The specific combination set forth in claim 1 was not disclosed or described in the references cited by the Examiner. Thus, claim 1 and all claims depending from claim 1 patentably distinguish.

Applicants invite the Examiner to contact the undersigned representative by telephone if a telephonic interview will advance prosecution.

Enclosed is a petition for a two-month extension of time, along with a check for \$420 to cover the required fee under 37 CFR 1.17. Should the Director determine that any other fee is due before the Examiner may consider this Amendment, such as a fee for a further extension of time, such extension is requested and the Director is authorized to charge the required fee to our Deposit Account No. 03-2775.

Respectfully submitted,

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Enclosure

Petition for 2-Mo Extension

\$420 check